

Delaware and Raritan Canal:
Six Mile Run Culvert
Under Delaware and Raritan Canal
.2 miles south of Blackwells Mills
Road
East Millstone Vicinity
Somerset County
New Jersey

HAER No. NJ-67

HAER
NJ,
18-MILE.V,
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
DELAWARE & RARITAN CANAL:
SIX MILE RUN CULVERT

HAER
NJ,
18-MILE.V,
1-

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Location: Extending beneath the Delaware & Raritan Canal 0.2 mile south of Blackwells Mills Rd., East Millstone Vicinity, Somerset County, New Jersey
UTM: 18.536300.4480120
Quad: Monmouth Junction, New Jersey

Date of Construction: circa 1834; partial rehabilitation, 1984 and 1986

Engineer: uncertain

Present Owner: N.J. Dept. of Environmental Protection
Division of Parks and Forestry, CN 402
Trenton, N.J. 08625

Present Use: Culvert to carry stream beneath the Delaware & Raritan Canal

Significance: The Six Mile Run Culvert is an integral part of the Delaware & Raritan Canal's (hereafter D&R Canal) early nineteenth-century engineering design. The culvert's original construction remains largely intact and consists of three 130-foot-long stone masonry barrels that carry Six Mile Run beneath the canal prism. Built between 1830 and 1834, the D&R Canal is an excellent example of early nineteenth-century American canal technology. In 1973, the D&R Canal, including Six Mile Run Culvert, was placed on the National Register of Historic Places.

Project Information: This documentation was undertaken by Historic Conservation and Interpretation, Inc. (hereinafter HCI) of Newton, N.J. during September and October, 1986 to record the outlet headwall of Six Mile Run Culvert prior to rehabilitation. The documentation was funded as a voluntary donation by the New Jersey Water Supply Authority, operator of the D&R Canal as a state water supply system.

Brian H. Morrell, HCI, Newton, N.J.

HISTORICAL OVERVIEW OF THE DELAWARE & RARITAN CANAL

The completion of the Delaware & Raritan Canal (hereinafter D&R Canal) across the narrow central "waist" of New Jersey in 1834 was the fruition of a more than one-hundred-year-old dream of creating an inland navigation that would eliminate travel around the extreme southern end of New Jersey for passage between the Hudson and Delaware rivers. Designed by well-known American canal engineer Canvass White and constructed between 1830 and 1834 by Irish immigrant labor, the waterway consisted of a 42-mile-long Main Canal that measured 75 feet wide and 8 feet deep and connected New Brunswick, N.J. on the Raritan River with Bordentown, N.J. on the Delaware River. Designed primarily to exploit the lucrative inter-regional anthracite trade, the canal served as an important navigation link in a network of canals extending eastward from the Pennsylvania coal fields to the New York metropolitan area. The D&R Canal was also a segment in the East Coast's inland waterway system, which provided passage between the northeastern and southeastern regions of the United States.

In 1871, the D&R Canal was leased to the Pennsylvania Railroad Company for 999 years. Competition from new through railroad links and unfavorable toll rates resulted in a continual decline in use of the canal until it was abandoned in 1933. The State of New Jersey assumed ownership of the canal in 1934, and in 1944 began conversion of the waterway to a water supply system. In 1973, the Delaware & Raritan Canal was entered on the National Register of Historic Places; one year later, it became the Delaware & Raritan Canal State Park. Currently, in addition to serving as a water supply system, the canal is one of the state's major historic districts and is a recreational corridor of ever-increasing importance in Central New Jersey.

Description of Six Mile Run Culvert

Six Mile Run Culvert is a triple barrel, stone arch culvert that carries the stream Six Mile Run beneath the Delaware & Raritan Canal in Franklin Township, Somerset County, N.J. Although its date of construction is unknown, the culvert may have been built during the 1830-34 construction of the overall canal. As the design engineer of the D&R Canal, Canvass White, a well-known American canal engineer, may thus have been responsible for the design of Six Mile Run Culvert.

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Six Mile Run Culvert is approximately 130 feet long, and its three barrels are 12 feet wide and from 8.5 to 9 feet high inside. At the inlet end of the culvert is a vertical drop in the streambed of about 5 feet, which is formed by a masonry wall. Above this spillway wall are the high stone arch barrels of the culvert's inlet headwall.

Known as a drop culvert, due to the vertical spillway at the inlet, this culvert design increased the rate of stream flow by creating a falls, thereby flushing out the culvert interior to prevent silt buildup. The present-day massive silt accumulation in Six Mile Run and the Millstone River immediately downstream of the culvert prevents the barrels from being flushed out as per the historic design.

Proceeding into the culvert 16 feet from the inlet headwall are interior stone arch barrels that are about 5 feet lower than the high barrels at the culvert inlet. The low, interior barrels continue throughout the rest of the length of the culvert. The entire interior of the culvert has a wooden plank floor to prevent the base of the culvert barrels from being eroded and thus undermined by the stream's flow.

The culvert inlet headwall was built of dark gray trap rock with cut granite voussoirs at the three barrel openings; the outlet headwall was constructed of shales and sandstone and has narrow, plain voussoirs. The stones used in the culvert are locally available; the exact location where the stones were quarried is unknown. The base of at least the inlet headwall with its curved wingwalls was constructed on thick plank footings.

Above the culvert outlet headwall and beneath the adjacent canal bank is a stone masonry vertical wall that extends horizontally on top of the culvert barrels, parallel with the outlet headwall. This horizontal masonry cutoff wall is attached to the tops of the culvert barrels and apparently serves to anchor the base of the canal bank and also prevent leakage from the canal bed along the top of the culvert.

Following the permanent closing of the D&R Canal for navigation in 1933, the State of New Jersey assumed ownership of the canal and currently operates it as a water supply system. In addition, the waterway provides recreational facilities, since it is part of a state park. The Delaware & Raritan Canal is also listed on the National Register of Historic Places.

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Under state ownership, the maintenance of Six Mile Run Culvert has been minimal, and it has been allowed to fall into a deteriorated condition. During the summer and fall of 1984, the New Jersey Water Supply Authority replaced the partially collapsed inlet headwall with a new concrete wall faced with a gray shale veneer with cut granite voussoirs. During the fall of 1986 through the spring of 1987, a major rehabilitation of the culvert outlet headwall was performed. At this time, the deteriorated upper portion of the headwall was replaced with poured concrete faced with a new stone veneer. As part of this latter project, the enclosed archival photographs were taken to record the culvert's original construction prior to rehabilitation. The rehabilitation of the culvert was part of an on-going maintenance program focusing on many of the canal's historic structures.

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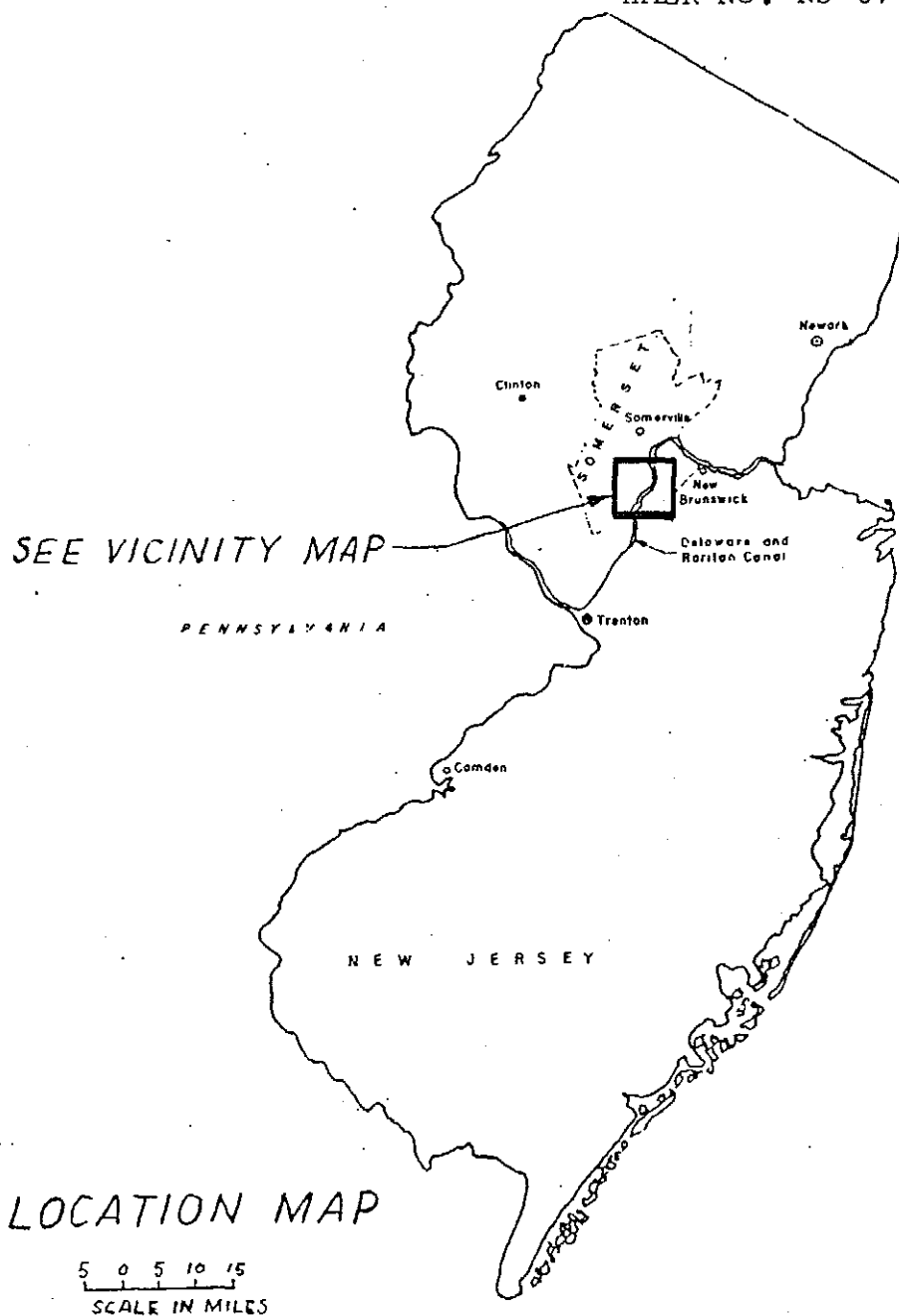
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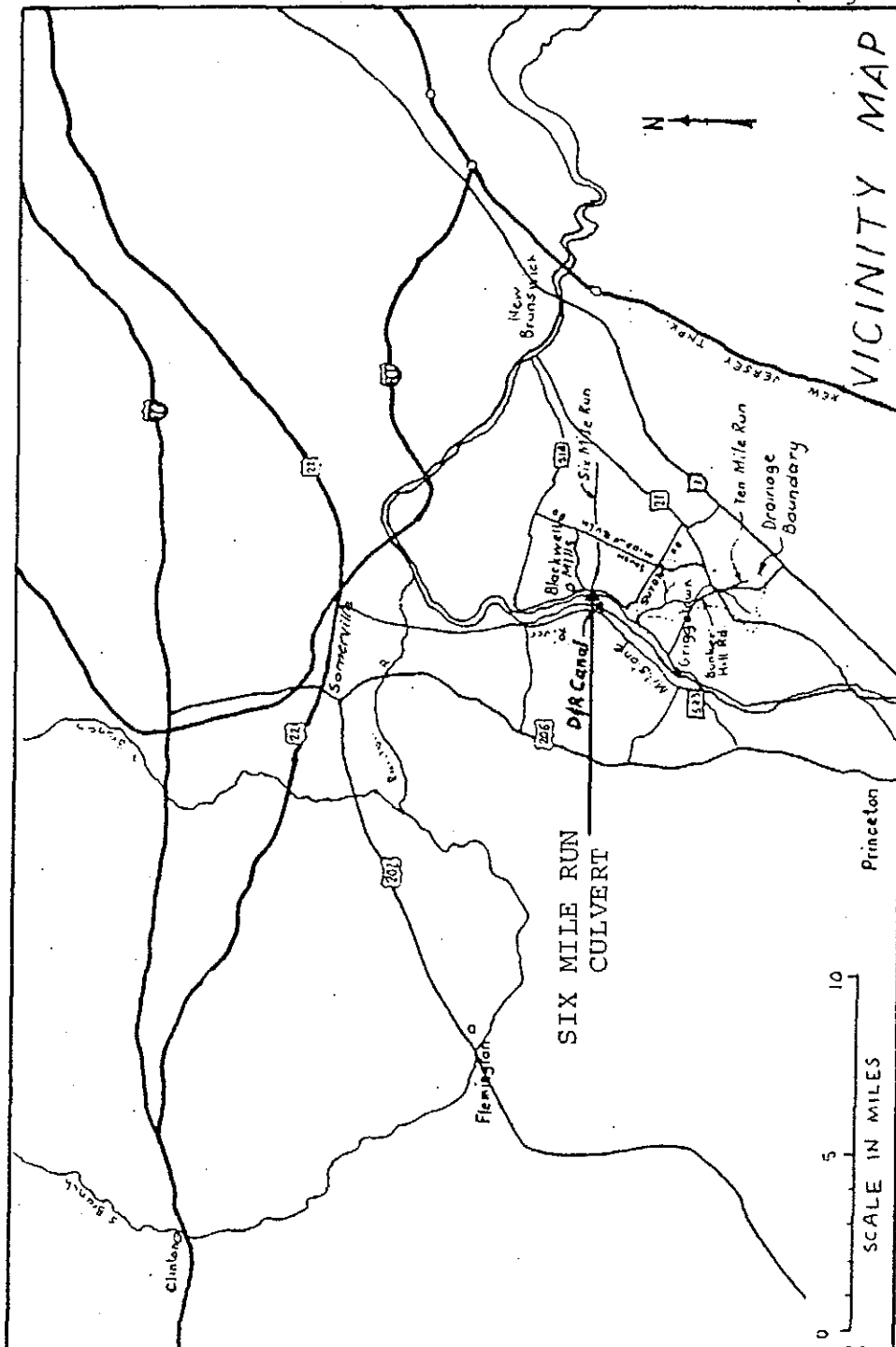
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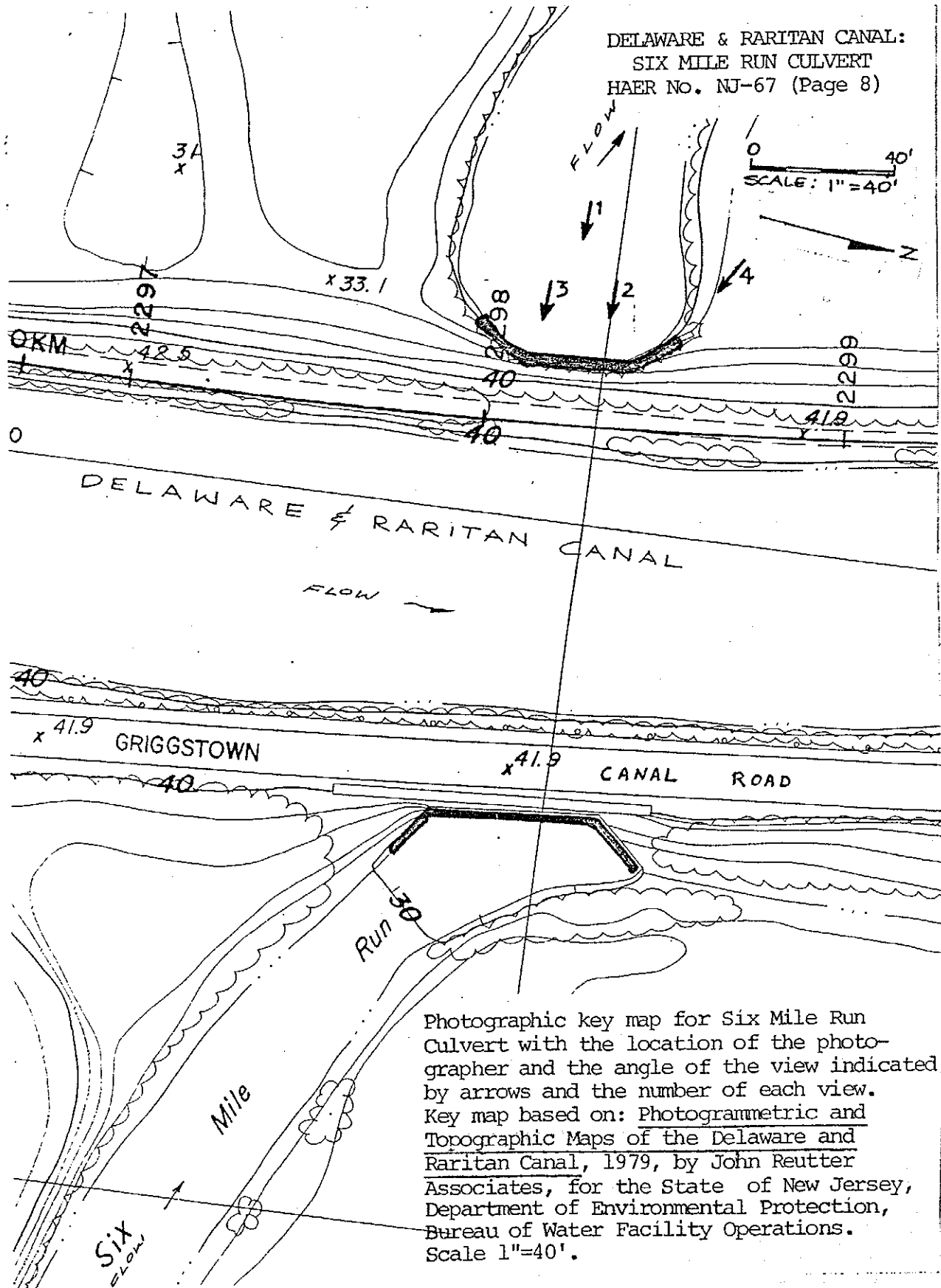
Location Map showing site of Six Mile Run Culvert outlined by a square. Map taken from construction plans entitled: Delaware and Raritan Canal Capital Improvement Program, Rehabilitation of The Ten Mile Run Culvert-Phase II, Station 2223+50, Including Repairs To The Six Mile Run Culvert, Station 2298+00, Franklin Township, Somerset County, June 1985. Prepared by Tippetts-Abbett-McCarthy-Stratton, Engineers, Architects and Planners, Bloomfield, New Jersey.

Vicinity Map showing site of Six Mile Run Culvert. Map taken from construction plans entitled: Delaware and Raritan Canal Capital Improvement Program, Rehabilitation Of The Ten Mile Run Culvert-Phase II, Station 2223+50, Including Repairs To The Six Mile Run Culvert, Station 2298+00, Franklin Township, Somerset County, June 1985. Prepared by Tippetts-Abbett - McCarthy-Stratton, Engineers, Architects and Planners, Bloomfield, New Jersey.

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Photographic key map for Six Mile Run Culvert with the location of the photographer and the angle of the view indicated by arrows and the number of each view. Key map based on: Photogrammetric and Topographic Maps of the Delaware and Raritan Canal, 1979, by John Reutter Associates, for the State of New Jersey, Department of Environmental Protection, Bureau of Water Facility Operations. Scale 1"=40'.